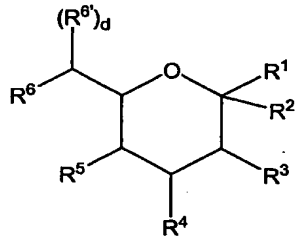
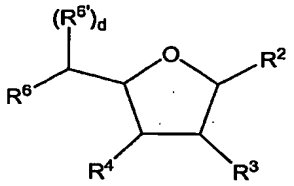
WHAT IS CLAIMED IS:

1 **1.** A compound having a formula that is a member selected from:



; and



2 I II

3 wherein

4 R^1 is H, CH_2OR^7, $COOR^7$ or OR^7

5 in which

6 R^7 represents H, substituted or unsubstituted alkyl or substituted or

7 unsubstituted heteroalkyl;

8 R^2 is a member selected from H, OH, an activating group and a moiety that includes a

9 nucleotide;

10 R^3, R^4, R^5, R^6 and $R^{6'}$ are independently selected from H, substituted or unsubstituted

11 alkyl, OR^9, and $NHC(O)R^{10}$

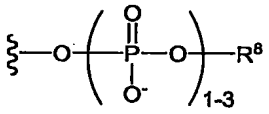
12 wherein

13 R^9 and R^{10} are independently selected from H, substituted or unsubstituted

14 alkyl or substituted or unsubstituted heteroalkyl,

15 and at least one of R^3, R^4, R^5, R^6 and $R^{6'}$ includes a polymeric modifying moiety.

1 **2.** The compound according to claim **1** wherein R^2 has the formula:



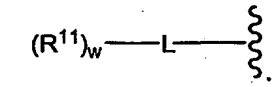
2

3 in which R^8 is a nucleoside.

1 **3.** The compound according to claim **2** wherein R^8 is a member selected from cytosine,

2 uridine, guanosine, adenosine and thymidine.

4. The compound according to claim **1** wherein at least one of R^3, R^4, R^5 and R^6 includes the moiety:



wherein

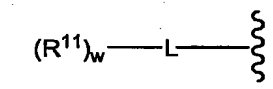
R^{11} is a polymeric modifying moiety;

L is a member selected from a bond and a linking group; and

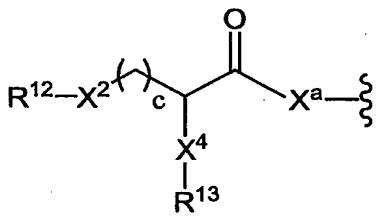
w is selected from the integers from 1 to 6.

5. The compound according to claim **4** wherein said linking group is a member selected from substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl moieties.

6. The compound according to claim **5** wherein the moiety:



has the formula:



wherein

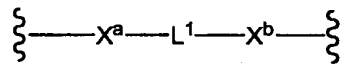
X^2 and X^4 are independently selected from linkage fragments;

X^a is a linkage fragment;

R^{12} and R^{13} are independently selected polymeric arms; and

c is an integer from 1 to 20.

7. The compound according to claim **5** wherein said linking group has the formula:



in which

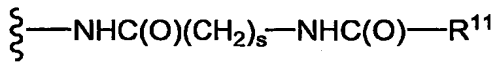
X^a and X^b are independently selected linkage fragments; and

L^1 is a member selected from a bond, substituted or unsubstituted alkyl or substituted or unsubstituted heteroalkyl.

8. The compound according to claim 7 wherein X^a and X^b are linkage fragments independently selected from S, SC(O)NH, HNC(O)S, SC(O)O, O, NH, NHC(O), (O)CNH and NHC(O)O, and OC(O)NH.

9. The compound according to claim 5 wherein said linker comprises an acyl moiety.

10. The compound according to claim 9 wherein L-R^{11} has the formula:

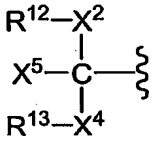


in which

s is an integer from 0 to 20; and

R^{11} is said polymeric modifying moiety.

11. The compound according to claim 1, wherein said polymeric modifying moiety has the formula:



wherein

X^2 and X^4 are independently selected from linkage fragments;

X^5 is a non-reactive group; and

R^{12} and R^{13} are independently selected polymeric arms.

12. The compound according to claim 11 wherein X^2 and X^4 are linkage fragments independently selected from S, SC(O)NH, HNC(O)S, SC(O)O, O, NH, NHC(O), (O)CNH and NHC(O)O, OC(O)NH and $(CH_2)_gY''$

wherein

g is an integer from 1 to 50; and

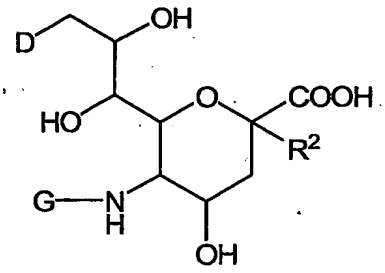
Y'' is a member selected from O, S and NH.

13. The compound according to claim 11 wherein

X^4 is a peptide bond; and

R^{13} is an amino acid residue.

14. The compound according to claim 1 having the formula:



in which

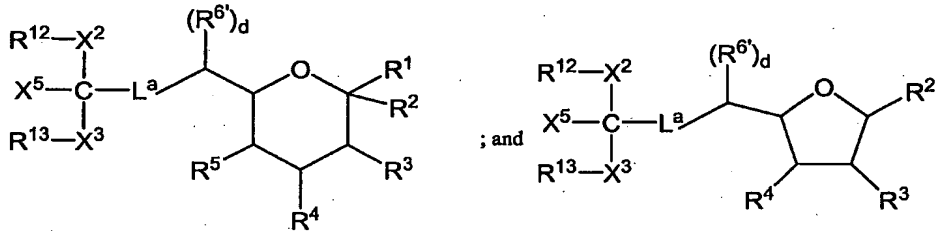
D is a member selected from -OH and $(R^{11})_{w'}$-L-;

G represents is a member selected from H, $(R^{11})_{w'}$-L- and -C(O)(C_1-C_6)alkyl;

w' is an integer from 2 to 6, and

at least one of D and G is $(R^{11})_{w'}$-L-.

15. The compound according to claim **14** having the formula:

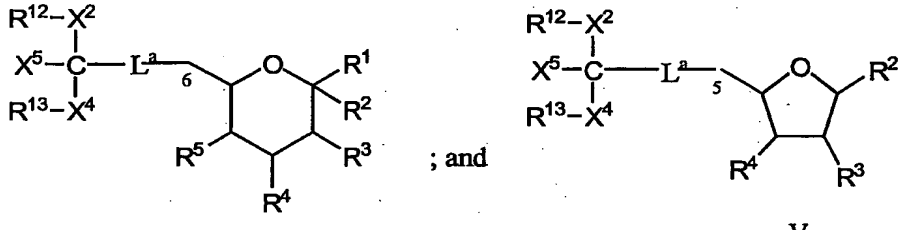


IV ; and V

wherein

L^a is a member selected from substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl.

16. The compound according to claim **1** having the formula:



IV ; and V

wherein

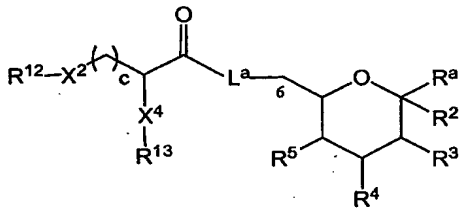
L^a is a member selected from an amino acid residue and a peptidyl residue having from 2 to 4 amino acid residues;

X^2 and X^4 are independently selected from linkage fragments;

X^5 is a non-reactive group; and

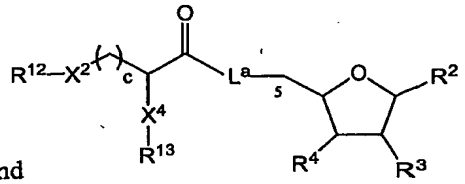
R^{12} and R^{13} are independently selected polymeric arms

17. The compound according to claim **16** having the formula:



VI

; and



VII

wherein

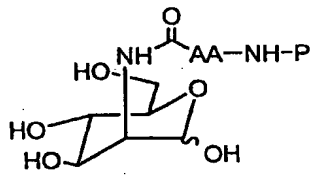
X^2 and X^4 are independently selected from linkage fragments;

X^a is a linkage fragment;

R^{12} and R^{13} are independently selected polymeric arms; and

c is an integer from 1 to 20.

18. The compound according to claim **1**, having the formula:



wherein

AA-NH is an amino acid residue; and

P is a polymeric modifying group.

19. The compound according to claim **18** wherein -AA-NH is $-CH_2NH$.

20. The compound according to claim **1** wherein said compound is a substrate for an enzyme that transfers a sugar moiety from a member selected from an activated sugar, a nucleotide sugar and combinations thereof onto an acceptor moiety of a substrate.

21. The compound according to claim **20** wherein said acceptor moiety is a member selected from a glycosyl residue, an amino acid residue and an aglycone.

22. A method of preparing cytidine monophosphate sialic acid-poly(ethylene glycol), said method comprising:

(a) contacting mannosamine with an activated, N-protected amino acid under conditions appropriate to form an amide conjugate between said mannosamine and the N-protected amino acid;

(b) contacting said amide conjugate with pyruvate and sialic acid aldolase under conditions appropriate to convert said amide conjugate to a sialic acid amide conjugate;

(c) contacting said sialic acid amide conjugate with cytidine triphosphates, and a synthetase under conditions appropriate to form a cytidine monophosphate sialic acid amide conjugate;

(d) removing the N-protecting group from said cytidine monophosphate sialic acid amide conjugate, thereby producing a free amine; and

(e) contacting said free amine with an activated PEG, thereby forming said cytidine monophosphate sialic acid-poly(ethylene glycol).

23. The method according to claim 21, wherein said activated N-protected amino acid has the formula: